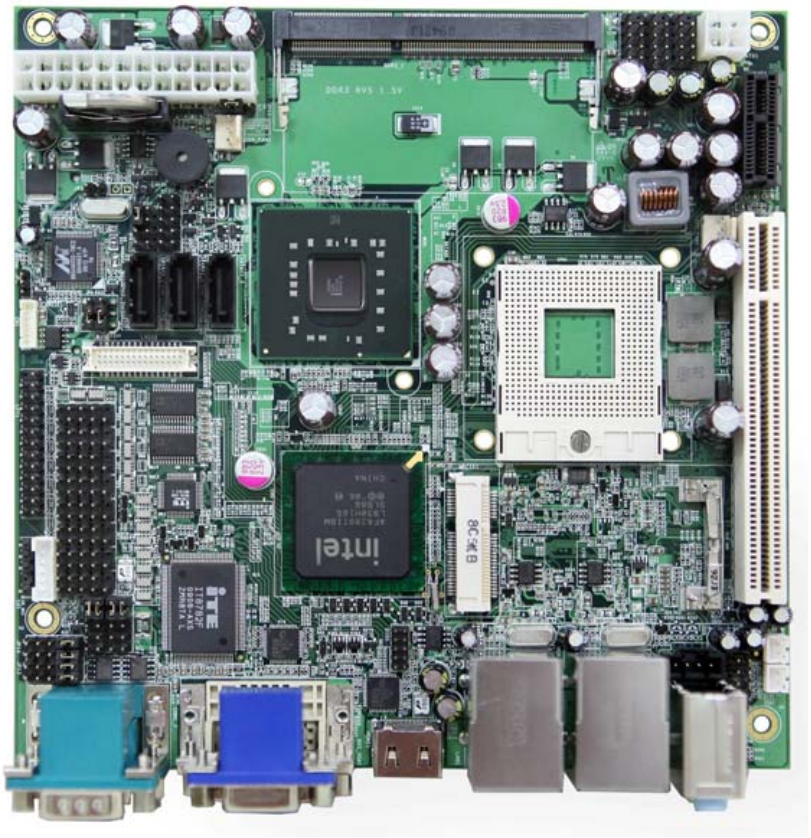
KEMX-4060

Industrial Motherboard in Mini-ITX form factor with Intel® GM45/ ICH9M

User's Guide



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Quanmax reserves the right to make changes without notice in product or component design as warranted by evolution in user needs or progress in engineering or manufacturing technology. Changes which affect the operation of the unit will be documented in the next revision of this user's guide.

Revision	Date	Edited by	Changes
1.0	01/04/2010	SLee	Initial Release
1.01	01/18/2009	SLee	ATXPWR1 & MPCIE1 Pin out modify
1.02	05/06/2010	Zack	Update some descriptions
1.03	10/18/2010	Zack	Update VGA 9th pin
1.04	01/29/2011	Zack	Add remark on clear CMOS

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Safety Instructions

■ Before You Begin

Before handling the product, read the instructions and safety guidelines on the following pages to prevent damage to the product and to ensure your own personal safety. Refer to the “Advisories” section in the Preface for advisory conventions used in this user’s guide, including the distinction between Warnings, Cautions, Important Notes, and Notes.

- Always use caution when handling/operating a computer. Only qualified, experienced, authorized electronics service personnel should access the interior of a computer. The power supplies produce high voltages and energy hazards, which can cause bodily harm.
- Use extreme caution when installing or removing components. Refer to the installation instructions in this user’s guide for precautions and procedures. If you have any questions, please contact Quanmax Post-Sales Technical Support.

WARNING

High voltages are present inside the chassis when the unit’s power cord is plugged into an electrical outlet. Turn off system power, turn off the power supply, and then disconnect the power cord from its source before removing the chassis cover. Turning off the system power switch does not remove power to components.

■ When Working Inside a Computer

Before taking covers off a computer, perform the following steps:

1. Turn off the computer and any peripherals.
2. Disconnect the computer and peripherals from their power sources or subsystems to prevent electric shock or system board damage. This does not apply when hot swapping parts.
3. Follow the guidelines provided in “Preventing Electrostatic Discharge” on the following page.

4. Disconnect any telephone or telecommunications lines from the computer.

In addition, take note of these safety guidelines when appropriate:

- To help avoid possible damage to system boards, wait five seconds after turning off the computer before removing a component, removing a system board, or disconnecting a peripheral device from the computer.
- When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs. If you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before connecting a cable, make sure both connectors are correctly oriented and aligned.

CAUTION

Do not attempt to service the system yourself except as explained in this user's guide. Follow installation and troubleshooting instructions closely.

Preventing Electrostatic Discharge

Static electricity can harm system boards. Perform service at an ESD workstation and follow proper ESD procedure to reduce the risk of damage to components. Quanmax strongly encourages you to follow proper ESD procedure, which can include wrist straps and smocks, when servicing equipment.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- When unpacking a static-sensitive component from its shipping carton, do not remove the component's antistatic packing material until you are ready to install the component in a computer. Just before unwrapping the antistatic packaging, be sure you are at an ESD workstation or grounded. This will discharge any static electricity that may have built up in your body.
- When transporting a sensitive component, first place it in an antistatic container or packaging.
- Handle all sensitive components at an ESD workstation. If possible, use antistatic floor pads and workbench pads.
- Handle components and boards with care. Don't touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.
- Do not handle or store system boards near strong electrostatic, electromagnetic, magnetic, or radioactive fields.

Preface

■ How to Use This Guide

This guide is designed to be used as step-by-step instructions for installation, and as a reference for operation, troubleshooting, and upgrades.

NOTE

Driver downloads and additional information are available under Downloads on our web site: www.quanmax.com.

■ Unpacking

When unpacking, follow these steps:

1. After opening the box, save it and the packing material for possible future shipment.
2. Remove all items from the box. If any items listed on the purchase order are missing, notify Quanmax customer service immediately.
3. Inspect the product for damage. If there is damage, notify Quanmax customer service immediately. Refer to “Warranty Policy” for the return procedure.

■ Regulatory Compliance Statements

This section provides the FCC compliance statement for Class A devices.

FCC Compliance Statement for Class A Devices

The product(s) described in this user’s guide has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the user’s guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area (domestic environment) is likely to cause harmful interference, in which case

the user will be required to correct the interference (take adequate measures) at their own expense. Changes or modifications not expressly approved by Quanmax could void the user's authority to operate the equipment.

NOTE

The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interference or to be noncompliant with the appropriate standards for its intended use.

■ Warranty Policy

Limited Warranty

Quanmax Inc.'s detailed Limited Warranty policy can be found under Support at www.quanmax.com. Please consult your distributor for warranty verification.

The limited warranty is void if the product has been subjected to alteration, neglect, misuse, or abuse; if any repairs have been attempted by anyone other than Quanmax or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of Quanmax or the manufacturer. Neglect, misuse, and abuse shall include any installation, operation, or maintenance of the product other than in accordance with the user's guide.

No agent, dealer, distributor, service company, or other party is authorized to change, modify, or extend the terms of this Limited Warranty in any manner whatsoever. Quanmax reserves the right to make changes or improvements in any product without incurring any obligation to similarly alter products previously purchased.

Return Procedure

For any Limited Warranty return, please contact Support at www.quanmax.com and login to obtain a Return Material Authorization (RMA) Number. If you do not have an account, send an email to support@quanmax.com to apply for one.

All product(s) returned to Quanmax for service or credit must be accompanied by a Return Material Authorization (RMA) Number. Freight on all returned items must be prepaid by the customer who is responsible for any loss or damage caused by common carrier in transit. Returns for Warranty must include a Failure Report for each unit, by serial number(s), as well as a copy of the original invoice showing the date of purchase.

To reduce risk of damage, returns of product must be in a Quanmax shipping container. If the original container has been lost or damaged, new shipping

containers may be obtained from Quanmax Customer Service at a nominal cost. Quanmax owns all parts removed from repaired products. Quanmax uses new and reconditioned parts made by various manufacturers in performing warranty repairs and building replacement products. If Quanmax repairs or replaces a product, its warranty term is not extended.

Shipments not in compliance with this Limited Warranty Return Policy will not be accepted by Quanmax.

Limitation of Liability

In no event shall Quanmax be liable for any defect in hardware, software, loss, or inadequacy of data of any kind, or for any direct, indirect, incidental, or consequential damages in connection with or arising out of the performance or use of any product furnished hereunder. Quanmax's liability shall in no event exceed the purchase price of the product purchased hereunder. The foregoing limitation of liability shall be equally applicable to any service provided by Quanmax or its authorized agent.

■ Maintaining Your Computer

Environmental Factors

- **Temperature**

  The ambient temperature within an enclosure may be greater than room ambient temperature. Installation in an enclosure should be such that the amount of air flow required for safe operation is not compromised. Consideration should be given to the maximum rated ambient temperature. Overheating can cause a variety of problems, including premature aging and failure of chips or mechanical failure of devices.

  If the system has been exposed to abnormally cold temperatures, allow a two-hour warm-up period to bring it up to normal operating temperature before turning it on. Failure to do so may cause damage to internal components, particularly the hard disk drive.

- **Humidity**

  High-humidity can cause moisture to enter and accumulate in the system. This moisture can cause corrosion of internal components and degrade such properties as electrical resistance and thermal conductivity. Extreme moisture buildup inside the system can result in electrical shorts, which can cause serious damage to the system.

  Buildings in which climate is controlled usually maintain an acceptable level of humidity for system equipment. However, if a system is located in an unusually

humid location, a dehumidifier can be used to maintain the humidity within an acceptable range. Refer to the “Specifications” section of this user’s guide for the operating and storage humidity specifications.

- **Altitude**
  Operating a system at a high altitude (low pressure) reduces the efficiency of the cooling fans to cool the system. This can cause electrical problems related to arcing and corona effects. This condition can also cause sealed components with internal pressure, such as electrolytic capacitors, to fail or perform at reduced efficiency.

Power Protection

The greatest threats to a system’s supply of power are power loss, power spikes, and power surges caused by electrical storms, which interrupt system operation and/or damage system components. To protect your system, always properly ground power cables and one of the following devices.

- **Surge Protector**
  Surge protectors are available in a variety of types and usually provide a level of protection proportional with the cost of the device. Surge protectors prevent voltage spikes from entering a system through the AC power cord. Surge protectors, however, do not offer protection against brownouts, which occur when the voltage drops more than 20 percent below the normal AC line voltage level.
- **Line Conditioner**
  Line conditioners go beyond the over voltage protection of surge protectors. Line conditioners keep a system’s AC power source voltage at a fairly constant level and, therefore, can handle brownouts. Because of this added protection, line conditioners cost more than surge protectors. However, line conditioners cannot protect against a complete loss of power.
- **Uninterruptible Power Supply**
  Uninterruptible power supply (UPS) systems offer the most complete protection against variations on power because they use battery power to keep the server running when AC power is lost. The battery is charged by the AC power while it is available, so when AC power is lost, the battery can provide power to the system for a limited amount of time, depending on the UPS system.
  UPS systems range in price from a few hundred dollars to several thousand dollars, with the more expensive unit s allowing you to run larger systems for a longer period of time when AC power is lost. UPS systems that provide only 5 minutes of battery power let you conduct an orderly shutdown of the system,

but are not intended to provide continued operation. Surge protectors should be used with all UPS systems, and the UPS system should be Underwriters Laboratories (UL) safety approved.

Chapter 1

Introduction

■ Overview

The new KEMX-4060 is a Mini-ITX form factor industrial motherboard combining the high performance Intel® Core 2 Duo 45nm processor with the high integration of the Intel® GM45/ ICH9M chipset. Featured are two DDR3-800/1066 SO-DIMM up to 8GB, Mobile Intel® Graphics Media Accelerator 4500MHD supports DirectX 10, MPEG2, WMV9(VC-1), H.264(AVC), 18/ 24-bit dual-channel LVDS, DVI-D, HDMI, Gigabit Ethernet, SATA 3 Gb/s, mini PCIe expansion slot, CF, 11x USB 2.0, 10x COM ports with voltage support HD audio, and keyboard/mouse. The KEMX-4060 is a compact, high performance industrial motherboard that is ideal for multimedia, gaming, digital signage and medical applications.

Checklist

- 1x KEMX-4060 Series mini-ITX motherboard
- 1x SATA cable
- 1x COM port cable
- 1x PS2 cable
- 1x I/O shield
- 1x Driver/ Manual CD
- 1x Quick Installation Guide

Features

- Intel® Core 2 Duo 45nm processor support
- Intel® GM45/ ICH9M chipset
- Mobile Intel® GMA 4500MHD supports DirectX 10, MPEG2, WMV9, and H.264
- VGA, DVI-D, HDMI, 18/24-bits dual channel LVDS
- Two DDR3 SO-DIMMs up to 8GB
- 3x SATA 3 Gb/s, CF socket,1x mini PCIex1 slot, 1x PCIe x1 slot (w/ 3x PCIe x1 speed)
- 2 x GbEs, 11x USB2.0, 10x COMs, 1 x LPT, HD audio with 2W amplifier onboard
- Watchdog Timer, Hardware Monitor

■ Product Specifications

CPU Support	Intel® Core 2 Duo (Socket P, Penryn Core)
Chipset	Intel® GM45 +ICH9M
Memory	2x DDR3 800/1066 SO-DIMM Socket, up to 8GB
BIOS	AMI PnP Flash BIOS
Display	Mobile Intel® Graphics Media Accelerator 4500MHD 18/24-bit dual-channel LVDS 1x HDMI 1x DVI-D 1x VGA
LAN	2x RJ-45, Gigabit Ethernet
Audio	HD Audio Codec, supports Line-in, Line-out & Mic-in Onboard 2W audio amplifier 1x wafer connector for CD-In S/PDIF support One 2x5-pins HD front panel audio support
Peripheral Support	1x CompactFlash socket 3x SATA 3Gb/s 10x COMs (KEMX-4060), 6x COMs (KEMX-4062) ● 2x DB-9 male connectors for COM1/2 ● RS422/485 supports on COM1 ● COM1 to 4 with +12V & +5V @ 1A support, select by jumper ● 8x headers for COM3 to 10 (KEMX-4060) ● 4x headers for COM3 to 6 (KEMX-4062) 11x USB 2.0 (4x connector+ 6x pin header +1 support by mini PCIe slot) 1x Parallel port (Pin Header) 1x IrDA (Pin Header) 1x Wafer connector for keyboard and mouse 4x DI/DO TPM 1.2 support (optional)
Power Connector	1x ATX-24P for power input 1x ATX-4P for CPU core power AT/ATX supported
Expansion	1x mini PCIex1 slot 1x PCIe riser for 3x PCIe x1 1x PCI slot with 2 x PCI master supported
Watchdog Timer	1-255 step
Hardware Monitor	Operating voltage, CPU temperature and fan speed
Dimensions	Mini-ITX (170 x 170 mm)
Environmental Factors	Operation Temp: 0ºC - 60ºC Storage Temp.: -10ºC - 85ºC Humidity: 0% - 90%
Certifications	CE, FCC Class A

Table 1 KEMX-4060 Specification

■ Comparison Chart

Model Name	KEMX-4060	KEMX-4062
PCB Layers	6	6
CPU	45nm Penryn Socket P CPUs	45nm Penryn Socket P CPUs
Chipset	GM45 / ICH9M	GM45 / ICH9M
Memory	**2 x SO-DIMM DDR3**	**2 x SO-DIMM DDR3**
VGA	Yes	Yes
LVDS	18/24-bits	18/24-bits
DVI-D	Yes	Yes
HDMI	Yes	Yes
LCD Back Light Control	Yes	Yes
Ethernet	2 x GbE	2 x GbE
Audio with 2W amplifier	Yes	Yes
SATA	3	3
Compact Flash	**1**	**1**
USB 2.0 Port	11	11
COM Port	**10**	**6**
COM Port with Voltage Support	4	4
RS-422/485	Yes	Yes
LPT Port	1	1
PS/2 Keyboard	Yes	Yes
PS/2 Mouse	Yes	Yes
Digital I/O	4-bits input / 4-bits Output	4-bits input / 4-bits Output
PCI Master	2	2
Mini PCIE	1	1
WatchDog	Yes	Yes
AT Power Support	Yes	Yes

Table 2 Comparison Chart

■ System Block Diagram

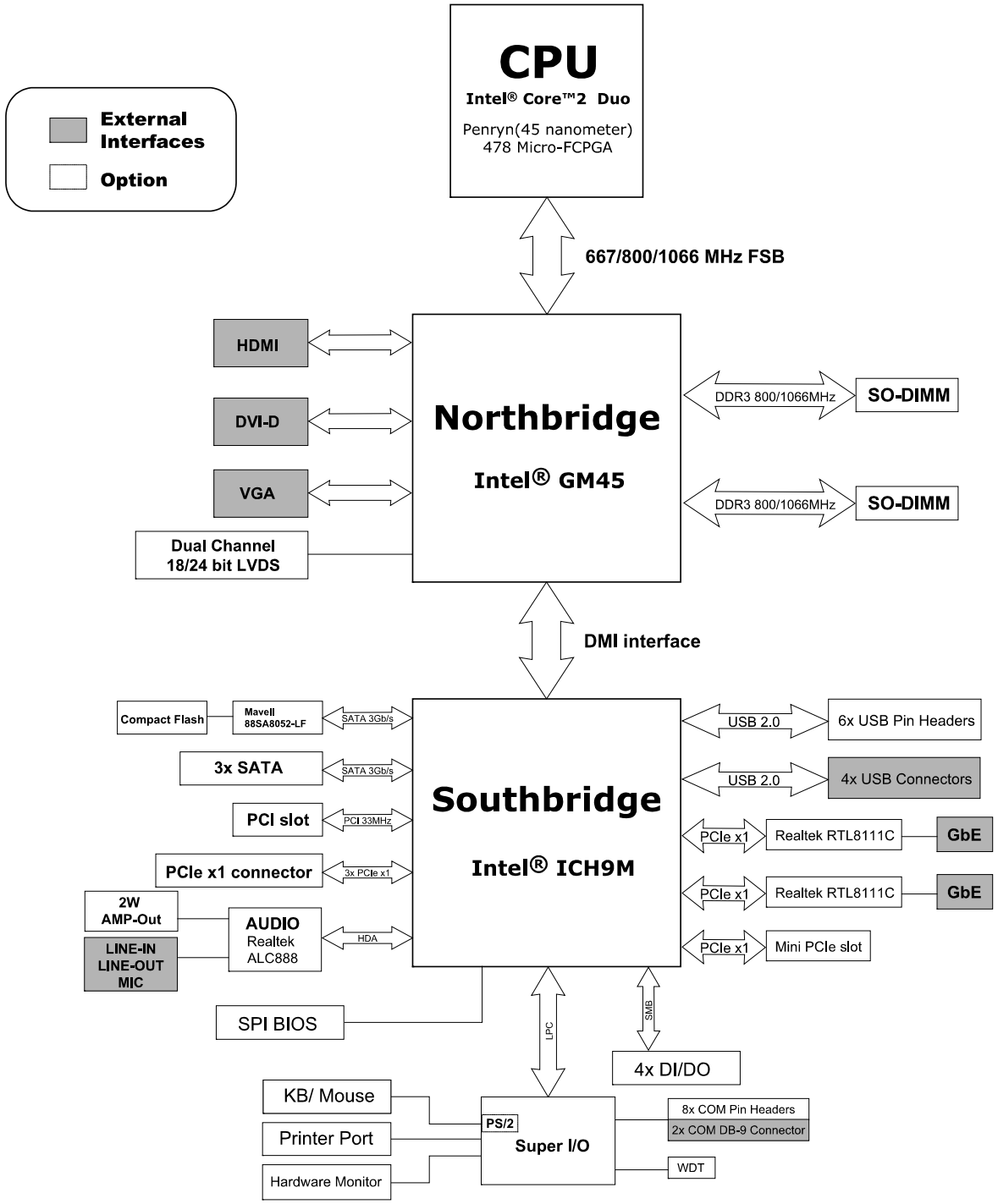


Figure 1 Block Diagram

■ Mechanical Dimensions

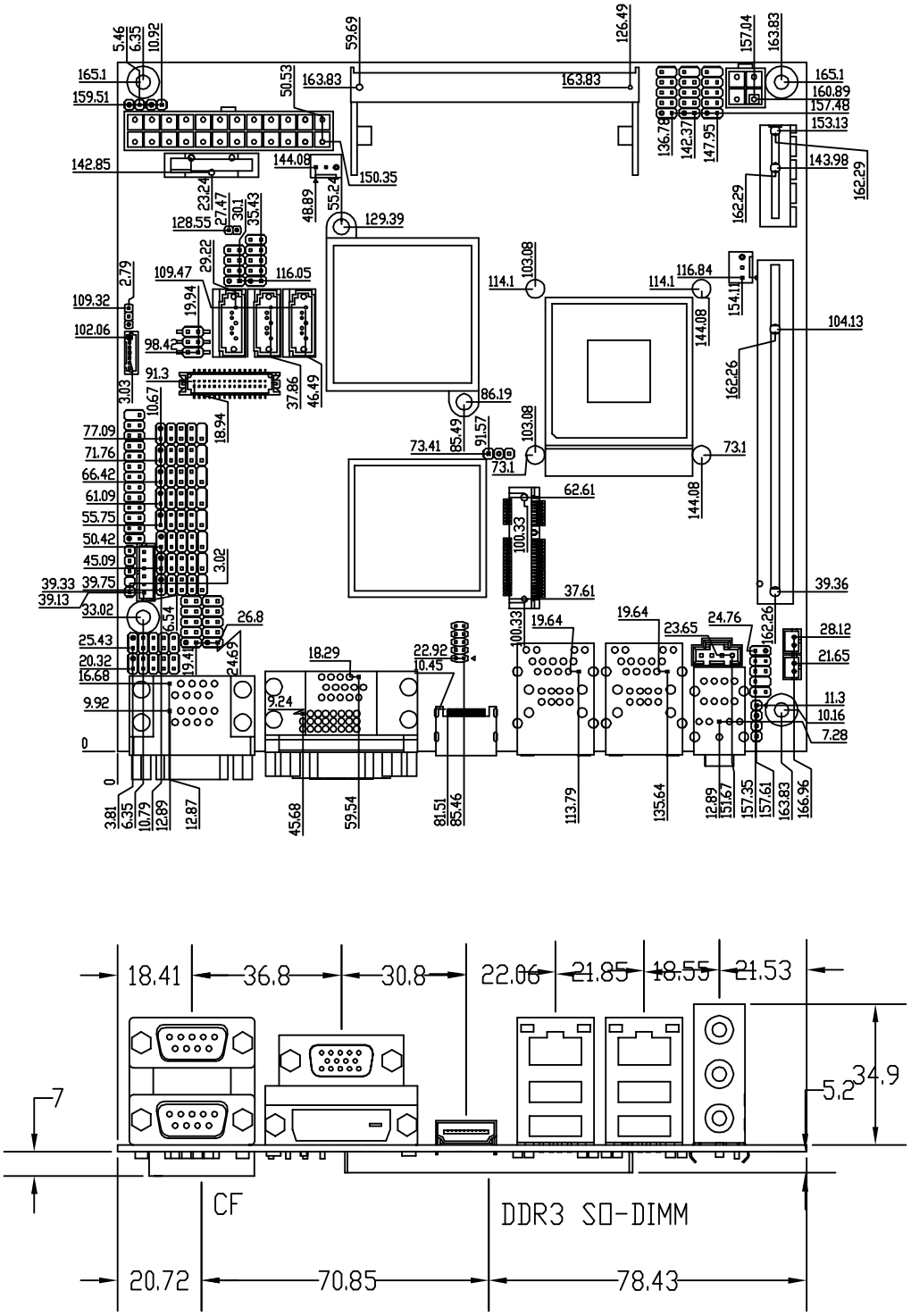


Figure 2 KEMX-4060 Mechanical Dimensions

Chapter 2

Hardware Settings

■ Overview

This chapter provides the definitions and locations of jumpers, headers, and connectors.

Jumpers

The product has several jumpers which must be properly configured to ensure correct operation.

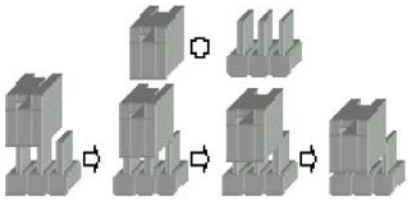


Figure 3 Jumper Connector

For a three-pin jumper (see Figure 3), the jumper setting is designated “1-2” when the jumper connects pins 1 and 2. The jumper setting is designated “2-3” when pins 2 and 3 are connected and so on. You will see that one of the lines surrounding a jumper pin is thick, which indicates pin No.1.
To move a jumper from one position to another, use needle-nose pliers or tweezers to pull the pin cap off the pins and move it to the desired position.

■ Jumper Settings and Pin Definitions

For jumper and connector locations, please refer to the diagrams below.

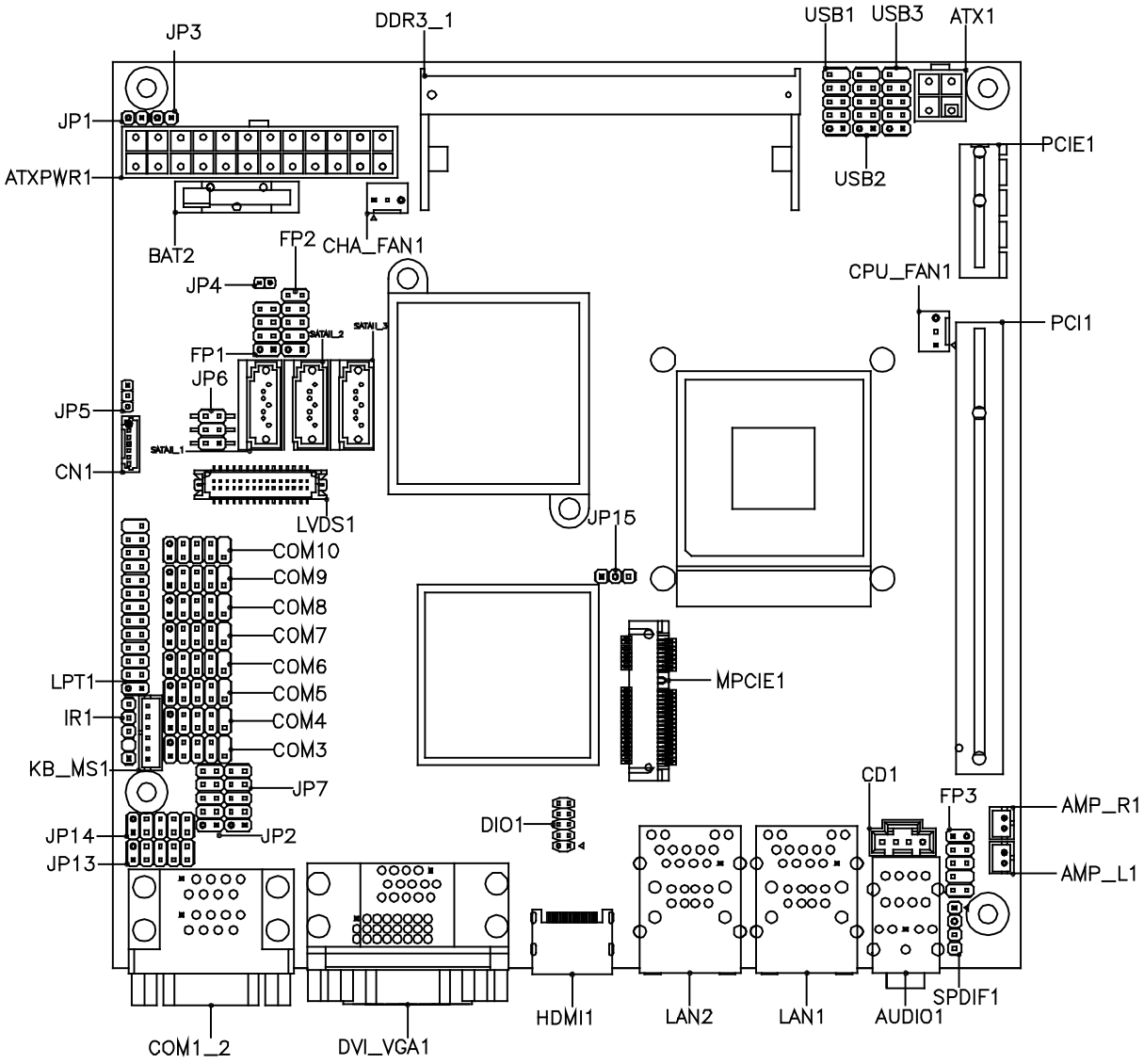


Figure 4 KEMX-4060 Jumper and Connector Locations

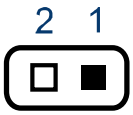
■ Jumper Settings

To ensure correct system configuration, the following section describes how to set the jumpers to enable/disable or change functions. For jumper descriptions, please refer to the table below.

Table 3 Jumper List

Label	Function
JP1	Clear CMOS Selection
JP13	COM1 Signal / Power Selection
JP14	COM2 Signal / Power Selection
JP7	COM3 Signal / Power Selection
JP2	COM4 Signal / Power Selection
JP6	Panel & Backlight Power Selection
JP5	BL Signal Selection
JP4	ATX/AT mode Selection
JP15	MPCIE Rev select

Table 4 JP1, Clear CMOS Selection

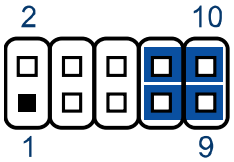


Jumper	Status
Open	Normal Operation (default)
Short	Clear CMOS

Pitch: 2.54mm [YIMTEX 3321*02SAGR(6T)]

Remark: You must go to **BIOS EXIT menu to do "**Load Optimal Defaults" after clear CMOS. Please refer to table 51.

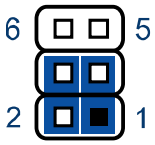
Table 5 JP13, JP14, JP7, JP2, COM1, 2, 3, 4 Port Signal / Power Selection



Jumper	Setting	Function
1	1-3 Short	Pin 1 = +12V
	3-5 Short	Pin 1 = +5V
	5-7 Short	Pin 1 = +5V
	7-9 Short	Pin 1 = DCD@RS232, TX-@RS422, DATA-@RS485(Half Duplex) (default)
2	2-4 Short	Pin 9 = +12V
	4-6 Short	Pin 9 = +5V
	6-8 Short	Pin 9 = +5V
	8-10 Short	Pin 9 = RI (default)

JP2,JP7,JP13,JP14 : Pitch:2.54mm [YIMTEX 3322*05SAGR(6T] LEAD FREE

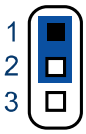
Table 6 JP6, Blacklight & Panel Power Selection



Jumper	Setting	Status
1	1-3	Backlight Power = +12V (default)
	3-5	Backlight Power = +5V
2	2-4	Panel Power = +3.3V (default)
	4-6	Panel Power = +5V

Pitch:2.54mm [YIMTEX 3362*03SAGR]

Table 7 JP5, BL Signal Selection



Jumper	Status
1-2	High Active (default)
2-3	Low Active

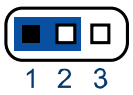
TYPE Pitch:2.0mm [YIMTEX 3291*03SAGR(6T)]

Table 8 JP4, ATX/AT mode Selection

Jumper	Status
Open	ATX mode(default)
Short	AT mode

Pitch:2.0mm [YIMTEX 3291*02SAGR(6T)]

Table 9 JP15, Mini PCIE Revision Selection



Jumper	Status
1-2	MPCIE Rev1.1 (default)
2-3	MPCIE Rev1.2

PIN HEADER,DIP 3P 1R MALE STRAIGHT TYPE Pitch:2.54mm [YIMTEX 3321*03SAGR(6T)]
LEAD FREE

■ Rear Panel Pin Assignments

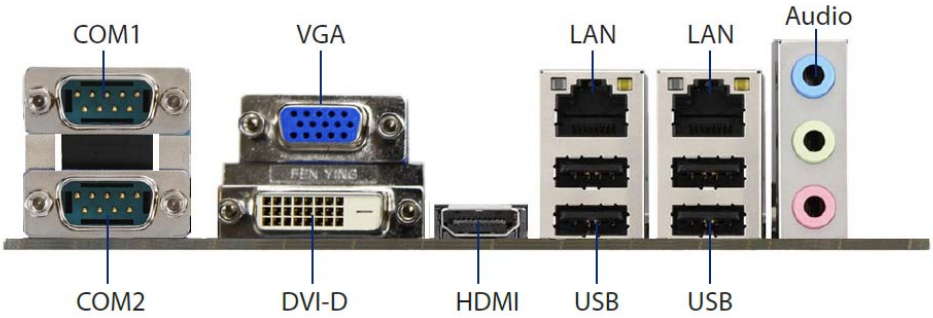
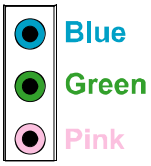


Table 10 AUDIO1, 3 Stack-up HD Audio Phone Jack

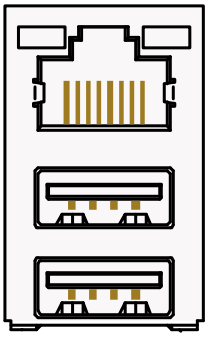


	Signal Name
BLUE	LINE IN
GREEN	LINE OUT
PINK	MIC IN

AUDIO JACK*3 DIP Vertical [Foxconn JA33331-H11P-4F]

*Support Jack re-tasking & multi-streaming

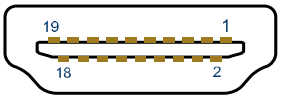
Table 11 LAN1,LAN2, RJ-45 + 2 USB 2.0 Connector



Pin	Signal	Pin	Signal
L1	VCC	L12	YLED+
L2	MDI[0]+	L13	GLED-
L3	MDI[0]-	L14	GLED+
L4	MDI[1]+	U1	+5VSV
L5	MDI[1]-	U2	USB_A-
L6	MDI[2]+	U3	USB_A+
L7	MDI[2]-	U4	GND
L8	MDI[3]+	U5	+5VSB
L9	MDI[3]-	U6	USB_B-
L10	GND	U7	USB_B+
L11	YLED-	U8	GND

[UDE RU1-161F9WGF(XB)]

Table 12 HDMI1, HDMI Connector

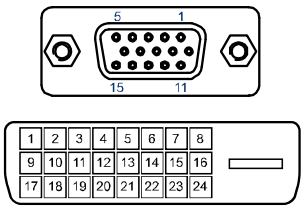


Pin	Signal	Pin	Signal
1	TMDS Data2+	11	TMDS Clock Shield
2	TMDS Data2 Shield	12	TMDS Clock–
3	TMDS Data2–	13	CEC

4	TMDS Data1+	14	Reserved
5	TMDS Data1 Shield	15	SCL
6	TMDS Data1–	16	SDA
7	TMDS Data0+	17	DDC/CEC Ground
8	TMDS Data0 Shield	18	+5 V Power
9	TMDS Data0–	19	Hot Plug Detect
10	TMDS Clock+		

[KUON YI HDMI-KRPS00-A03N2-L]

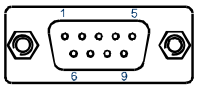
Table 13 DVI_VGA1, DVI-D + DB15 Connector



Pin	Signal	Pin	Signal
1	Tx2-	V1	R
2	Tx2+	V2	G
3	GND	V3	B
4	TX4-	V4	NC
5	TX4+	V5	GND
6	DDC_CLK	V6	VGA_EN
7	DDC_DATA	V7	GND
8	CRT_VSYNC	V8	GND
9	TX1-	V9	NC
10	TX1+	V10	GND
11	GND	V11	NC
12	TX3-	V12	SD_DATA
13	TX3+	V13	CRT_HSYNC
14	+5V	V14	CRT_VSYNC
15	GND	V15	SD_CLK
16	HTPLG	V16	GND
17	TX0-	V17	GND
18	TX0+		
19	GND		
20	TX5-		
21	TX5+		
22	GND		
23	TXC+	25	GND
24	TXC-	26	GND

,DVI 29P DIP (F) 90D H/D CONNECTOR WHITE [WIN WIN WDVI-29ABNW11U]

Table 14 COM1, RS-232 (RS-422/485**) DB-9 Connector

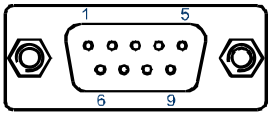


Pin	RS232	RS422 (COM1*)	RS485 Half Duplex (COM1*)
1	DCD, Data carrier detect	TX-	DATA-
2	RXD, Receive data	RX+	N/A
3	TXD, Transmit data	TX+	DATA+
4	DTR, Data terminal ready	RX-	N/A
5	GND, ground	GND	GND
6	DSR, Data set ready	N/A	N/A
7	RTS, Request to send	N/A	N/A
8	CTS, Clear to send	N/A	N/A
9	RI, Ring indicator (+5V / +12V *)	N/A	N/A

* The function can be selected by JP13

** The RS-232/422/485 function can be selected from BIOS setting.

Table 15 COM2, RS-232 DB-9 Connector



Pin	Signal	Pin	Signal
1	DCD, Data carrier detect	5	GND, ground
2	RXD, Receive data	6	DSR, Data set ready
3	TXD, Transmit data	7	RTS, Request to send
4	DTR, Data terminal ready	8	CTS, Clear to send
9	RI, Ring indicator (+5V / +12V *)		

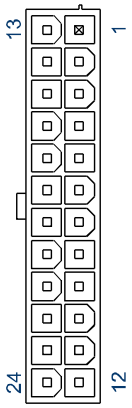
* The function can be selected from by JP14

Main Board Pin Assignments

Table 16 Internal Connector List

Label	Function
ATXPWR1	24-pin ATX Power Input Connector
ATX1	4-pin ATX Power Input Connector
CF1	CF Type II Connector
COM3	RS-232 Port 3 Pin Header
COM4	RS-232 Port 4 Pin Header
COM5	RS-232 Port 5 Pin Header
COM6	RS-232 Port 6 Pin Header
COM7	RS-232 Port 7 Pin Header
COM8	RS-232 Port 8 Pin Header
COM9	RS-232 Port 9 Pin Header
COM10	RS-232 Port 10 Pin Header
DIO1	Digital Input / Output Pin Header
SPDIF1	SPD/IF Output Pin Header
CN1	Panel Backlight Wafer
AMP_L1	Left Channel 2W Audio AMP Output Wafer
AMP_R1	Right Channel 2W Audio AMP Output Wafer
CD1	CD-ROM Audio Input Wafer
DDR3_1	Primary DDR3 Memory DIMM Slot
DDR3_2	Secondary DDR3 Memory DIMM Slot
CPU_FAN1	CPU FAN Wafer
CHA_FAN1	System FAN Wafer
FP1	Front Panel 1 Pin Header
FP2	Front Panel 2 Pin Header
LVDS1	LVDS Panel Connector
PCI1	32-bit / 33Mhz / 5V-key PCI Slot
PCIE1	None Standard PCI Express x1 Slot
SATAII_1	Serial ATA Connector
SATAII_2	Serial ATA Connector
SATAII_3	Serial ATA Connector
USB1	USB2.0 Port 4, 5 Pin Header
USB2	USB2.0 Port 6, 7 Pin Header
USB3	USB2.0 Port 8, 9 Pin Header
KB_MS1	KB/MS BOX Header
FP3	HD AUDIO Front Panel
LPT1	Parallel Port Pin Header
MPCIE1	Mini PCIe Connector
IR1	IrDA Pin Header

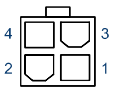
Table 17 ATXPWR1, 24-pin ATX Power Input Connector



Pin	Signal	Pin	Signal
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	POWER OK	20	NC
9	+5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

DIP 12P*2.180D(M) [YIMTEX 576MWA2*12STR]

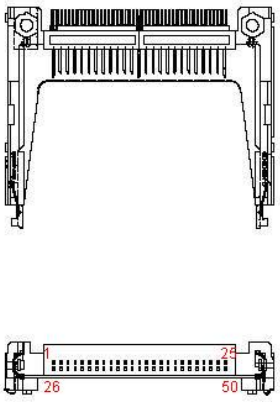
Table 18 ATX1, 4-pin ATX Power Input Connector



Pin	Signal	Pin	Signal
1	GND	2	GND
3	+12V	4	+12V

Pitch:4.2mm PIN [YIMTEX 576MWA2*02STR]

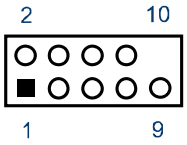
Table 19 CF1, CF Type II Connector



Signal Name	Pin	Pin	Signal Name
GND	1	26	GND
IDE Data 3	2	27	IDE Data 11
IDE Data 4	3	28	IDE Data 12
IDE Data 5	4	29	IDE Data 13
IDE Data 6	5	30	IDE Data 14
IDE Data 7	6	31	IDE Data 15
IDE Chip select 1#	7	32	IDE Chip select 3#
GND	8	33	GND
GND	9	34	IDEIOR#
GND	10	35	IDEIOW#
GND	11	36	+5V
GND	12	37	IDEIRQ
+5V	13	38	+5V
GND	14	39	PCSEL
GND	15	40	NC
GND	16	41	Reset IDE
GND	17	42	IDEIORDY
SDA2	18	43	DREQ
IDE Address 1	19	44	DACK#
IDE Address 0	20	45	IDE activity
IDE Data 0	21	46	PDIAG#
IDE Data 1	22	47	IDE Data 8
IDE Data 2	23	48	IDE Data 9
IOIS16#	24	49	IDE Data 10
GND	25	50	GND

Standard type[CF1A-71041-00E01]

Table 20 COM3-10, RS-232 Pin Header



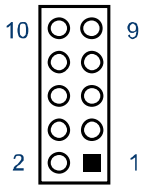
Pin	Signal
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator*
10	NC

Pitch:2.54mm [PINREX 210-92-05GB02]

* COM3 to 4 with +12V & +5V @ 1A support, select by jumper

Cable : COM Port cable, pitch 2.54mm 10P, D-SUB 9P, L=250mm, with bracket, 180degree,

Table 21 DIO1, Digital Input / Output Pin Header

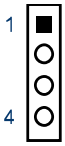


Pin	Signal	Pin	Signal
1	Digital Output 0	2	Digital Input 0
3	Digital Output 1	4	Digital Input 1
5	Digital Output 2	6	Digital Input 2
7	Digital Output 3	8	Digital Input 3
9	+VIO	10	GND

Pitch:2.0mm [YIMTEX 3292*05SAGR(6T)]

Cable: DIO Cable, DB9 Female connector to 2x5-pin pitch:2.0mm connector, L=30cm

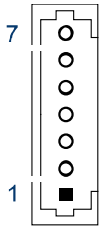
Table 22 SPDIF1, SPD/IF Input / Output Pin Header



Pin	Signal Name
1	SPDIF_IN
2	GND
3	SPDIF_OUT
4	GND

P-2.54mm [YIMTEX 3321*04SAGR(6T)]

Table 23 CN1, Panel Backlight Wafer



Pin	Signal Name
1	BL_EN*
2	GND
3	+5V / +12V **
4	+5V / +12V **
5	GND
6	BL_ADJ
7	NC

P-1.25mm WAFER [YIMTEX 501MW1*07STR]

*：Selected by JP5, **：Selected by JP6

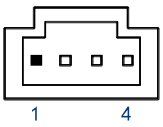
Note：BL_ADJ can be setting from 0V to 5V in BIOS setup.

Table 24 AMP_L1 , AMP_R1, 2W Audio AMP Output Wafer

Pin	Signal Name
1	Speaker+
2	Speaker-

Pitch=2.0mm WAFER [YIMTEX 503PW1*02STR]

Table 25 CD1, CD-ROM Audio Input Wafer



Pin	Signal Name
1	CD-IN-R
2	GND
3	GND
4	CD-IN-L

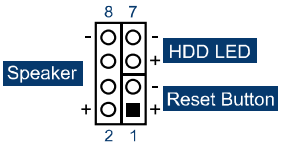
P-2.54mm WAFER [YIMTEX 522CW4SGR]

Table 26 CPU_FAN1, CHA_FAN1, FAN Wafer

Pin	Signal
1	GND
2	+12V
3	FAN_RPM

P-2.54mm WAFER [YIMTEX 521AW1*03STR]

Table 27 FP1, Front Panel 1 Pin Header

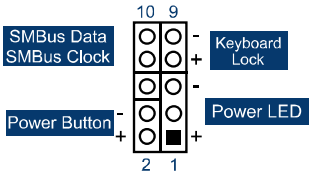


Pin	Signal	Pin	Signal
1	Reset Button +	2	Speaker +
3	Reset Button -	4	NC
5	HDD LED +	6	Internal Speaker-
7	HDD LED -	8	Speaker -

Pitch:2.54mm [YIMTEX 3322*04SAGR(6T)]

Note：Internal Buzzer is enabled when Pin6-8 is shorted.

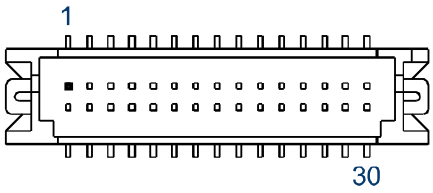
Table 28 FP2, Front Panel 2 Pin Header



Pin	Signal	Pin	Signal
1	Power LED +	2	Power Button +
3	NC	4	Power Button -
5	Power LED -	6	NC
7	Keyboard Lock	8	SMBus Data
9	GND	10	SMBus Clock

Pitch:2.54mm [YIMTEX 3322*05SAGR(6T]

Table 29 LVDS1, LVDS Panel Connector

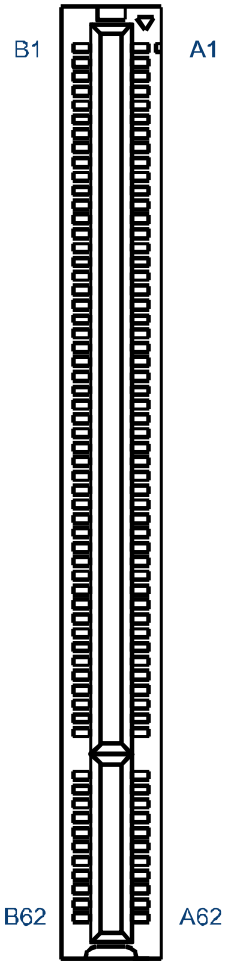


Signal Name	Pin	Pin	Signal Name
NC	2	1	NC
+3.3V / +5V*	4	3	+3.3V / +5V*
TxclkB-	6	5	TxclkA-
TxclkB+	8	7	TxclkA+
GND	10	9	GND
TxoutB0-	12	11	TxoutA0-
TxoutB0+	14	13	TxoutA0+
TxoutB1-	16	15	TxoutA1-
TxoutB1+	18	17	TxoutA1+
TxoutB2-	20	19	TxoutA2-
TxoutB2+	22	21	TxoutA2+
TxoutB3-	24	23	TxoutA3-
TxoutB3+	26	25	TxoutA3+
GND	28	27	GND
I2C_Clock	30	29	I2C_Data

Pitch:1.25mm Tin Plated [HIROSE DF13-30DP-1.25(24)]

* this function can be selected by JP6

Table 30 PCI1, 32-bit / 33Mhz / 5V-key PCI Slot



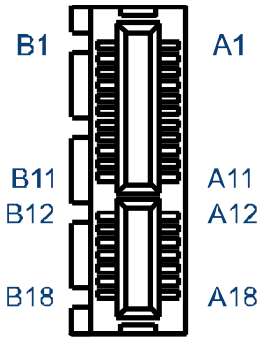
Pin	Side B	Side A
1	-12V	Reserved
2	Reserved	+12V
3	Ground	Reserved
4	Reserved	Reserved
5	+5V	+5V
6	+5V	INTA#
7	INTB#	INTC#
8	INTD#	+5V
9	Reserved	GNT1# *
10	REQ1# *	+5V
11	Reserved	IDSEL1 *
12	Ground	Ground
13	Ground	Ground
14	CLK1 *	+3.3VAUX
15	Ground	RST#
16	CLK0	+5V
17	Ground	GNT0#
18	REQ0#	Ground
19	+5V	PME#
20	AD[31]	AD[30]
21	AD[29]	+3.3V
22	Ground	AD[28]
23	AD[27]	AD[26]
24	AD[25]	Ground
25	+3.3V	AD[24]
26	C/BE[3]#	IDSEL0
27	AD[23]	+3.3V
28	Ground	AD[22]
29	AD[21]	AD[20]
30	AD[19]	Ground
31	+3.3V	AD[18]
32	AD[17]	AD[16]

33	C/BE[2]#	+3.3V
34	Ground	FRAME#
35	IRDY#	Ground
36	+3.3V	TRDY#
37	DEVSEL#	Ground
38	Ground	STOP#
39	LOCK#	+3.3V
40	PERR#	SMB_CLK
41	+3.3V	SMB_DAT
42	SERR#	Ground
43	+3.3V	PAR
44	C/BE[1]#	AD[15]
45	AD[14]	+3.3V
46	Ground	AD[13]
47	AD[12]	AD[11]
48	AD[10]	Ground
49	Ground	AD[09]
50	KEY	
51		
52	AD[08]	C/BE[0]#
53	AD[07]	+3.3V
54	+3.3V	AD[06]
55	AD[05]	AD[04]
56	AD[03]	Ground
57	Ground	AD[02]
58	AD[01]	AD[00]
59	+5V	+5V
60	Reserved	Reserved
61	+5V	+5V
62	+5V	+5V

PCI 60*2P 180D (F)　[FOXCONN EH06001-DAW-DF]

*：Reserved for second PCI master device.

Table 31 PCIE1, Non Standard PCI Express x1 Slot



Pin	Side B	Side A
1	+12V	+3.3V
2	+12V	+3.3V
3	+3.3VAUX	Ground
4	WAKE#	REFCLK+
5	RST#	REFCLK-
6	Ground	Ground
7	PETp0	PERp0
8	PETn0	PERn0
9	Ground	Ground
10	PETp1	PERp1
11	PETn1	PERn1
12	SMB_CLK	SMB_DAT
13	Ground	Ground
14	PETp2	PERp2
15	PETn2	PERn2
16	Ground	Ground
17	NC	NC
18	NC	NC

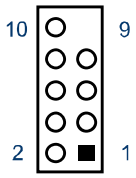
WPES-036AN3B22UWS [TECHBEST]

Table 32 SATAII_1, SATAII_2, SATAII_3, Serial ATA Connector

Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

[FOXCONN LD1807V-S52U]

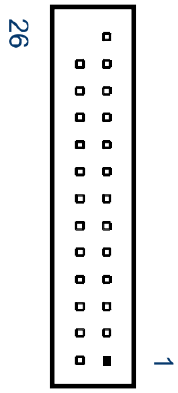
Table 33 USB1, USB2, USB3, USB2.0 Pin Header



Pin	Signal Name	Pin	Signal Name
1	+5V	2	+5V
3	USB_A-	4	USB_B-
5	USB_A+	6	USB_B+
7	GND	8	GND
9	KEY	10	GND

Pitch: 2.54mm [YIMTEX 3322*05SAGR(6T) -09]

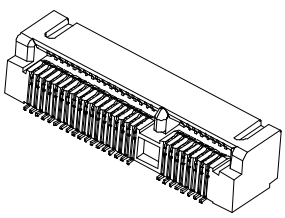
Table 34 LPT1, Parallel Port DB-25 Connector



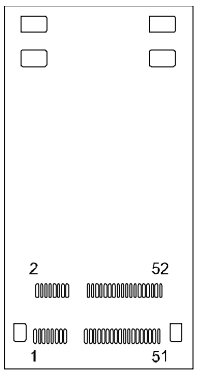
Signal	Pin	Pin	Signal
Line printer strobe	1	2	AutoFeed
PD0, parallel data 0	3	4	Error
PD1, parallel data 1	5	6	Initialize
PD2, parallel data 2	7	8	Select In
PD3, parallel data 3	9	10	Ground
PD4, parallel data 4	11	12	Ground
PD5, parallel data 5	13	14	Ground
PD6, parallel data 6	15	16	Ground
PD7, parallel data 7	17	18	Ground
ACK, acknowledge	19	20	Ground
Busy	21	22	Ground
Paper empty	23	24	Ground
Select	25		

Pitch:2.54mm [PINREX 210-72-13GB11]

Table 35 MPCIE1, Mini PCIe Connector



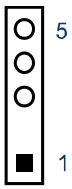
Signal	Pin	Pin	Signal
WAKE#	1	2	+3.3V_MPCIE
Reserved	3	4	Ground
Reserved	5	6	+1.5V
Reserved	7	8	Reserved
Ground	9	10	Reserved
REFCLK-	11	12	Reserved
REFCLK+	13	14	Reserved



Ground	15	16	Reserved
Reserved	17	18	Ground
Reserved	19	20	W_disable#
Ground	21	22	PERST#
PERn0	23	24	+3VSB
PERp0	25	26	Ground
Ground	27	28	+1.5V
Ground	29	30	SMB_CLK
PETn0	31	32	SMB_DATA
PETp0	33	34	Ground
Ground	35	36	USB_D-
Reserved	37	38	USB_D+
+3.3VSB	39	40	Ground
+3.3VSB	41	42	Reserved
Reserved	43	44	Reserved
Reserved	45	46	Reserved
Reserved	47	48	+1.5V
Reserved	49	50	Ground
Reserved	51	52	+3.3V

MINI PCI-Express Connector [FOXCONN AS0B226-S56N-7F]

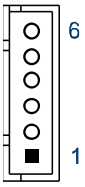
Table 36 IR1 Pin Header



Pin	Signal Name
1	+5V
2	Key
3	RXD
4	GND
5	TXD

Pitch:2.54mm [YIMTEX 3321*05SAGR(6T)-02]

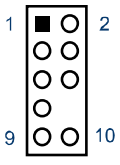
Table 37 KB_MS1, Keyboard and mouse connector



Pin	Signal
1	MS_CLK
2	+5V
3	MS_DATA
4	KB_DAT
5	GND
6	KB_CLK

WAFER DIP 6P MALE 1R 180D P=2.0mm [STM M24266]

Table 38 FP3, HD AUDIO Front Panel



Pin	Signal	Pin	Signal
1	MIC2_L	2	AGND
3	MIC2_R	4	ACZ_DET
5	LIN2_R	6	MIC2_JD
7	SENSE	8	NC
9	LIN2_L	10	LINE2_JD

P-2.54mm w/o Pin 8 [YIMTEX 3322*05SAGR(6T)-08]

Chapter 3

System Installation

■ Processor Installation

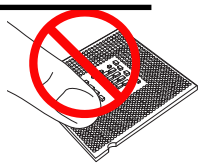
Processor Handling

Carefully follow the steps below in order to prepare the CPU for installation:

1. Remove processor from packaging.
2. Handle the CPU by grasping the substrate edges only with thumb and forefinger.

CAUTION

DO NOT TOUCH PROCESSOR CONTACTS TO PREVENT DAMAGING THE CPU.



Installing the CPU

Carefully follow the steps below in order to install the CPU:

1. Check and confirm that you are installing the correct CPU type.
2. Using a screwdriver, disengage (open) the socket actuator, as shown in figure below.

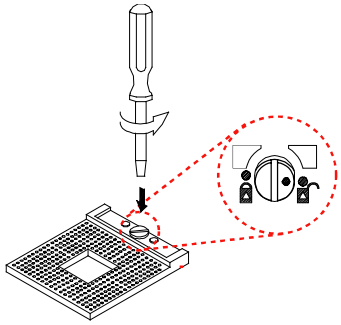


Figure 5 Disengage the socket actuator

3. Align the gold triangle on the CPU with the similar marking on the socket (see Figure below). If the processor does not drop completely into the socket, turn the socket actuator to the open position until the processor drops completely in.

Note: *You should not have to press down on the processor. If the processor does not drop completely into the socket, turn the actuator until the processor drops completely in.*

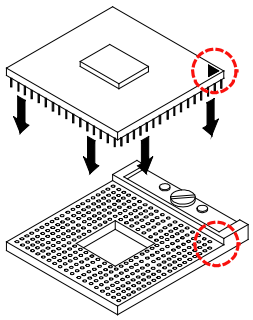


Figure 6 CPU alignment in Micro-FCPGA Socket (Socket P)

4. While gently holding the processor down with your finger, secure the processor in the socket with a screwdriver by turning the socket actuator to the closed position:

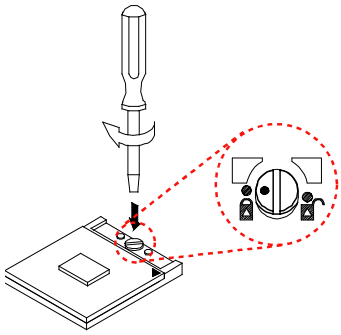


Figure 7 Secure the processor in the socket

Removing the CPU:

To remove the CPU, reverse the installation steps.

1. Before removing the CPU, turn off the system power and wait for about 20 minutes until the heat radiation plate of the cooling fan and the CPU cools down.
2. To remove the CPU, follow Step 2 of Installing the CPU above.
3. Remove the CPU by grasping the substrate edges only with thumb and forefinger and lifting it out with a purely vertical motion.

WARNING

The CPU and the heatsink may be hot and could cause burns.

■ Cooler Installation

The system must not be operated without a cooler (heat sink and fan) to provide the necessarily cooling. Install the cooling unit supplied as follows:

CAUTION

Make sure that good thermal contact is made between the processor and heat sink. Insufficient contact or incorrect use of heat sink, fan, or thermal compound can cause the processor to overheat, which may crash the system or cause permanent damage to the CPU.

1. Install the correct CPU as described above.
2. Align the screw holes of the heatsink rear retention bracket with the mounting holes on the underside of the motherboard, located at the four corners of the CPU location. Insert into the holes and turn the motherboard over.
3. Place the heatsink/fan assembly on top of the CPU with the cooling fins aligned with the Northbridge heatsink cooling fins. This will allow the fan to provide cooling the Northbridge. Align the screws with the screw holes of the rear retention bracket.

NOTE

Be careful not to touch the thermal pad on the underside of the heatsink. This pad is made of thermal compound and is deformable. It is designed to make optimal thermal contact with the CPU. No additional thermal compound is required.

4. Tighten each screw halfway to secure the cooler assembly to the motherboard. Then gradually tighten all four screws. Do not fully tighten the first screw before partially tightening the other screws as this may apply uneven pressure to the CPU, causing damage.

NOTE

In order to operate the KEMX-4060 without a fan, the cooling solution must be integrally designed with the chassis. Contact Quanmax for more information on fan less operation.

■ Memory Module Installation

Carefully follow the steps below in order to install the DIMMs:

1. To avoid generating static electricity and damaging the SO-DIMM, ground yourself by touching a grounded metal surface or use a ground strap before you touch the SO-DIMM.
2. Do not touch the connectors of the SO-DIMM. Dirt or other residue may cause a malfunction.
3. Hold the SO-DIMM with its notch aligned with the memory socket of the board and insert it at a 30-degree angle into the socket.

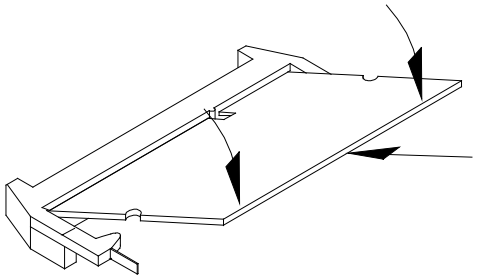


Figure 8 Align the SO-DIMM Memory Module with the onboard socket

4. Fully insert the module into the socket until a “click” is heard.
5. Press down on the SO-DIMM so that the tabs of the socket lock on both sides of the module

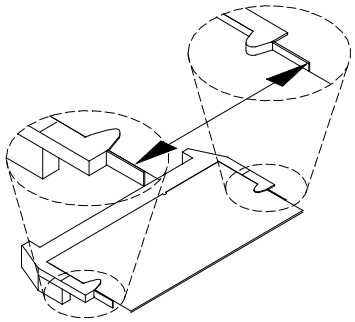


Figure 9 Press down on the SO-DIMM Memory Module

Removing a DIMM:

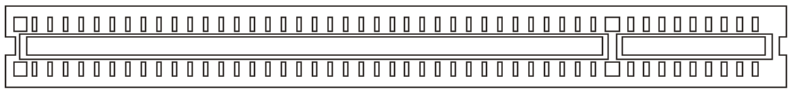
To remove the SO-DIMM, use your fingers or a small screwdriver to carefully push away the tabs that secure either side of the SO-DIMM. Lift it out of the socket.

Make sure you store the SO-DIMM in an anti-static bag. The socket must be populated with memory modules of the same size and manufacturer.

■ Expansion Interfaces

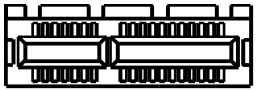
The board comes with one PCI slot, one PCIe x1 slot and 1x mini PCIex1 slot.

PCI slot



32-bit, 33MHz PCI slot

PCIe x1 slot
(non standard)



1x PCIe riser for 3x PCIe x1

mini PCIe x1 slot

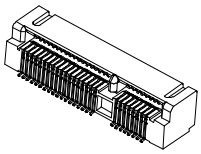


Figure 10 Expansion Interfaces

NOTE

When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to configure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

Chapter 4

AMI BIOS Setup

■ Overview

This chapter provides a description of the AMI BIOS. The BIOS setup menus and available selections may vary from those of your product. For specific information on the BIOS for your product, please contact Quanmax.

NOTE: The BIOS menus and selections for your product may vary from those in this chapter. For the BIOS manual specific to your product, please contact Quanmax.

AMI's ROM BIOS provides a built-in Setup program, which allows the user to modify the basic system configuration and hardware parameters. The modified data will be stored in a battery-backed CMOS, so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM will not need to be changed unless there is a configuration change in the system, such as a hard drive replacement or when a device is added.
It is possible for the CMOS battery to fail, which will cause data loss in the CMOS only. If this happens you will need to reconfigure your BIOS settings.

■ Main Menu

The BIOS Setup is accessed by pressing the DEL key after the Power-On Self-Test (POST) memory test begins and before the operating system boot begins. Once you enter the BIOS Setup Utility, the Main Menu will appear on the screen. The Main Menu provides System Overview information and allows you to set the System Time and Date. Use the "<" and ">" cursor keys to navigate between menu screens.

Table 39 BIOS Main Menu

BIOS SETUP UTILITY		
Main Advanced Boot Chipset Power Security Exit		
System Date	[Thu 12/24/2009]	Use [ENTER], [TAB] or [SHIFT-TAB] to select a field.
System Time	[10:18:15]	
> SATA1	:[Maxtor 6V160E0]	Use [+] or [-] to configure system Time.
> SATA2	:[Not Detected]	
> SATA3	:[Not Detected]	
> CF	:[Not Detected]	
> System Information		<> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
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Below table is described for SATA1-3 and onboard CF setting.

Table 40 SATA and onboard CF Device Setting Menu

BIOS SETUP UTILITY		
Main		
SATA1		Select the type of device connected to the system. <> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
Device	:Hard Disk	
Vendor	:Maxtor 6V160E0	
Size	:160.0GB	
LBA Mode	:Supported	
Block Mode	:16 Sectors	
PIO Mode	:4	
Async DMA	:MultiWord DMA-2	
Ultra DMA	:Ultra DMA-6	
S.M.A.R.T.	:Supported	
LBA/ Large Mode	[Auto]	
DMA Mode	[Auto]	
S.M.A.R.T	[Auto]	
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LBA/ Large Mode [Auto]

Enables or disables the LBA (Logical Block Addressing)/ Large mode. Setting to Auto enables the LBA mode if the device supports this mode, and if the device was

not previously formatted with LBA mode disabled.

Options: Disabled, Auto

DMA Mode [Auto]

Setup DMA Mode.

S.M.A.R.T [Auto]

SMART stands for Smart Monitoring, Analysis, and Reporting Technology. It allows AMIBIOS to use the SMART protocol to report server system information over a network. Options: Auto, Disabled, Enabled

Table 41 System Information

BIOS SETUP UTILITY	
Main	
AMIBIOS Version : 1.0 Build Date :12/24/2009 Processor Intel(R) CPU (TM) 2 Duo T9400 @2.53GHz Speed :2533 MHz Physical Memory Size :1024MB Speed :1067MHz	<> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
V02.61 (C)Copyright 1985-2006, American Megatrends, Inc.	

■ Advanced Menu

Table 42 Advanced Menu

BIOS SETUP UTILITY	
Main **Advanced** Boot Chipset Power Security Exit	
Advanced Settings **Warning: Setting wrong values in below sections may cause system to malfunction.** > I/O Configuration > OnBoard Peripherals Configuration > Hardware Health Configuration	<> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
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Press <Enter> to select a sub-menu for detailed options.

Table 43 I/O Configuration

BIOS SETUP UTILITY		
Advanced		
Onboard I/O Configuration		Allows BIOS to Select Serial Port1 Base Addresses.
COM1 Address	[3F8]	
COM1 IRQ	[4]	
COM1 Function Type	[RS232]	
COM2 Address	[2F8]	
COM2 IRQ	[4]	<> Select Screen
COM3 Address	[3E8]	↑↓ Select Item
COM3 IRQ	[10]	+- Change Field
COM4 Address	[2E8]	Tab Select Field
COM4 IRQ	[11]	F1 General Help
COM5 Address	[2F0]	F10 Save and Exit
COM5 IRQ	[5]	ESC Exit
COM5 Mode	[Normal]	
COM6 Address	[2E0]	
COM6 IRQ	[6]	
COM7 Address	[2B0]	
COM7 IRQ	[3]	
COM8 Address	[2B8]	
COM8 IRQ	[3]	
COM9 Address	[2C0]	
COM9 IRQ	[10]	
COM10 Address	[2C8]	
COM10 IRQ	[10]	
Parallel Port Address	[378]	
Parallel Port Mode	[Normal]	
Parallel Port IRQ	[IRQ7]	
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COM1 Address [3F8]

Options: Disabled, 3F8, 3E8, 2E8

COM1 IRQ [4]

Options: 3, 4, 10, 11

COM1 Function Type [RS232]

Options: RS232, RS422, RS485

COM2 Address [2F8]

Options: Disabled, 3F8, 3E8, 2E8

COM2 IRQ [4]

Options: 3, 4, 10, 11

COM3 Address [3E8]

Options: Disabled, 3F8, 3E8, 2E8

COM3 IRQ [10]

Options: 3, 4, 10, 11

COM4 Address [2E8]

Options: Disabled, 3F8, 2F8, 3E8, 2E8, 2F0, 2E0

COM4 IRQ [11]

Options: 3, 4, 10, 11

COM5 Address [2F0]

Options: Disabled, 3F8, 2F8, 3E8, 2E8, 2F0, 2E0

COM5 IRQ [5]

Options: 3, 4, 5, 6, 7, 10, 11

COM5 Mode [Normal]

Options: Normal, IrDA, ASK IR

COM6 Address [2E0]

Options: Disabled, 3F8, 2F8, 3E8, 2E8, 2F0, 2E0

COM6 IRQ [6]

Options: 3, 4, 5, 6, 7, 10, 11

COM7 Address [2B0]

Options: Disabled, 2B0, 2B8, 2C0, 2C8, 2D0, 2D8

COM7 IRQ [3]

Options: 3, 6, 7, 10

COM8 Address [2B8]

Options: Disabled, 2B0, 2B8, 2C0, 2C8, 2D0, 2D8

COM8 IRQ [3]

Options: 3, 6, 7, 10

COM9 Address [2C0]

Options: Disabled, 2B0, 2B8, 2C0, 2C8, 2D0, 2D8

COM9 IRQ [10]

Options: 3, 6, 7, 10

COM10 Address [2C8]

Options: Disabled, 2B0, 2B8, 2C0, 2C8, 2D0, 2D8

COM10 IRQ [10]

Options: 3, 6, 7, 10

Parallel Port Address [378]

Options: Disabled, 378, 278, 3BC

Parallel Port Mode [Normal]

Options: Normal, EPP, ECP, EPP+ECP

Parallel Port IRQ [IRQ7]

Options: IRQ5, IRQ7

Table 44 OnBoard Peripherals Configuration Settings

BIOS SETUP UTILITY		
Advanced		
OnBoard Peripherals Configuration Settings		Options
USB Functions	**[12 USB Ports]**	
USB 2.0 Controller	[Enable]	Disabled
Legacy USB Support	[Enable]	12 USB Ports
Audio Controller	[Enable]	
Onboard LAN1 Controller	[Enable]	<> Select Screen
Onboard LAN2 Controller	[Enable]	↑↓ Select Item
Onboard LAN OPTROM	[Disabled]	+- Change Field
Onboard Mini PCIE Controller	[Enable]	Tab Select Field
> On-Chip ATA Devices		F1 General Help
		F10 Save and Exit
		ESC Exit
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USB Functions [12 USB Ports]

Options: Disabled, 2 USB Ports, 4 USB Ports, 6 USB Ports, 8 USB Ports, 10 USB Ports, 12 USB Ports

USB 2.0 Controller [Enabled]

Legacy USB Support [Enabled]

Options: Disabled, Enabled, Auto

Audio Controller [Enabled]

Options: Enabled, Disabled

Onboard LAN1 Controller [Enabled]

Options: Enabled, Disabled

Onboard LAN2 Controller [Enabled]

Options: Enabled, Disabled

Onboard LAN OPTROM

Options: Enabled, Disabled

Onboard Mini PCIE Controller

Options: Enabled, Disabled

> On-Chip ATA Configuration

SATA Configuration [Enabled]

Options: Enabled, Disabled

Configure SATA as [IDE]

Options: IDE, AHCI

Table 45 Hardware Health Configuration

BIOS SETUP UTILITY		
Advanced		
Hardware Health Configuration		Disabled 80°C 85°C 90°C 95°C <> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
CPU Warning Temperature	[Disabled]	
CPU Shutdown Temperature	[Disabled]	
CPU Temperature	:57°C/ 134°F	
SYS Temperature	:43°C/ 109°F	
CPU Fan Speed	:2354 RPM	
SYS Fan Speed	:6490 RPM	
+VCORE	:1.072V	
+3.30V	:3.440V	
+5.00V	:5.080V	
+12.0V	:12.032V	
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CPU Warning Temperature

Options: Disabled, 80°C/176°F, 85°C/185°F, 90°C/194°F, 95°C/203°F

CPU Shutdown Temperature

Options: Disabled, 80°C/176°F, 85°C/185°F, 90°C/194°F, 95°C/203°F

■ Boot Menu

Table 46 Boot Menu

BIOS SETUP UTILITY						
Main	Advanced	**Boot**	Chipset	Power	Security	Exit

Boot Settings		Specifies the Boot Device Priority sequence.
> Boot Device Priority		
> Hard Disk Drives		
		<> Select Screen
Quick Boot	[Enabled]	↑↓ Select Item
Full Screen LOGO Display	[Disabled]	+- Change Field
Bootup Num-Lock	[On]	Tab Select Field
Wait For 'F1' If Error	[Enabled]	F1 General Help
Hit 'DEL'Message Display	[Enabled]	F10 Save and Exit
		ESC Exit

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Boot Device Priority

Specifies the Boot Device Priority sequence.

Hard Disk Drivers

Specifies the Boot Device Priority sequence from available Hard Drives.

Quick Boot [Enabled]

Enabling this item allows BIOS to skip some Power On Self Tests (POST) while booting to decrease the time needed to boot the system. When set to [Disabled], BIOS performs all the POST items.

Options: Disabled, Enabled

Full Screen LOGO Display [Disabled]

Options: Disabled, Enabled

Bootup Num-Lock [On]

Allow you to select the power-on state for the NumLock.

Options: Off, On

Wait for 'F1' If Error [Enabled]

When set to Enabled, the system waits for F1 key to be pressed when error occurs.

Options: Disabled, Enabled

Hit 'DEL' Message Display [Enabled]

When set to Enabled, the system displays the message 'Press DEL to run Setup' during POST.

Options: Disabled, Enabled

■ Chipset Menu

Table 47 Chipset Menu

BIOS SETUP UTILITY						
Main	Advanced	Boot	**Chipset**	Power	Security	Exit

Chipset Settings		Select which graphics controller to use as the primary boot device.
Boot Graphics Adapter Priority	[IDG]	
Internal Graphics Mode Select	[Enabled, 32MB]	
> Video Function Configuration		<> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit

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Boots Graphic Adapter Priority [IGD]

Select which graphics controller to use as the primary boot device.

Options: IGD, PCI/IGD, PCI/PEG, PEG/IGD , PEG/PCI

Internal Graphics Mode Select [Enabled 32MB]

Select the amount of system memory used by the Internal graphics device.

Options: Disabled, Enabled 32MB, Enabled 64MB, Enabled 128MB

Table 48 Video Function Configuration

BIOS SETUP UTILITY		
Chipset		
Video Function Configuration		Select which graphics controller to use as the primary boot device.
DVMT Mode Select	[DVMT Mode]	
DVMT/FIXED memory	[256 MB]	
Boot Display Device	[CRT+DVI]	<> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
Flat Panel Type	[1024x768 24Bit 1C]	
Panel Backlight Voltage(v)	[2.5]	

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DVMT Mode Select

Options: DVMT Mode

DVMT/FIXED Memory [256MB] (This setting is only for WinXp)

Options: 128MB, 256MB, Maximum DVMT

Boot Display Device [CRT+DVI]

Options: CRT, DVI, CRT+DVI, LVDS, CRT+LVDS

Flat Panel Type [1024x768 24Bit 1C]

Options:

1024x768 24 Bit 1CH

1280x1024 24 Bit 2CH

1366x768 24 Bit 2CH

1920x1080 24 Bit 2CH

Panel BackLight Voltage [2.5]

Options: Min 0.0V, Max: 5.0V

■ Power Menu

Table 49 Power Menu

BIOS SETUP UTILITY						
Main	Advanced	Boot	Chipset	**Power**	Security	Exit

Power Management Setting		
ACPI Function	[Enabled]	Enable/ Disable ACPI support for Operating System.
Suspend mode	[S3 (STR)]	
Repost Video on S3 Resume	[No]	<> Select Screen
Restore on AC Power Loss by IO	[Power Off]	↑↓ Select Item
Resume By PS/2 KB/MS From S3	[Disabled]	+- Change Field
Resume From S3 By USB Device	[Disabled]	Tab Select Field
Resume On Ring	[Disabled]	F1 General Help
Resume By PME#	[Disabled]	F10 Save and Exit
Resume By PCI-E Device	[Disabled]	ESC Exit
Resume By RTC Alarm	[Disabled]	

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ACPI Function [Enabled]

Options: Disabled, Enabled

Suspend mode [S3(STR)]

Options: S1 (POS), S3 (STR)

Repost Video on S3 Resume [No]

Options: No, Yes

Restore On AC Power Loss by IO [Power Off]

Options: Power Off, Power On, Last State

Resume By PS/2 KB/MS From S3 [Disabled]

Options: Disabled, Enabled

Resume From S3 By USB Device [Disabled]

Options: Disabled, Enabled

Resume On Ring [Disabled]

Options: Disabled, Enabled

Resume By PME# [Disabled]

Options: Disabled, Enabled

Resume By PCI-E Device [Disabled]

Options: Disabled, Enabled

Resume By RTC Alarm [Disabled]

Options: Disabled, Enabled

■ Security Menu

Table 50 Security Menu

BIOS SETUP UTILITY						
Main	Advanced	Boot	Chipset	Power	**Security**	Exit
Security Setting					Install or Change the password.	
Supervisor Password :Not Installed						
User Password :Not Installed						
Change Supervisor Password					<> Select Screen	
Change User Password					↑↓ Select Item	
					+- Change Field	
					Tab Select Field	
					F1 General Help	
					F10 Save and Exit	
					ESC Exit	
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Change Supervisor Password

Select this item to set or change the supervisor password. The Supervisor Password item on top of the screen displays the default Not Installed. After you have set a password, this item displays Installed.

Change User Password

Select this item to set or change the user password. The User Password item on top of the screen displays the default Not Installed. After you have set a password, this item displays Installed.

■ Exit Menu

Table 51 Exit Menu

BIOS SETUP UTILITY						
Main	Advanced	Boot	Chipset	Power	Security	**Exit**
Exit Setting **Save Changes and Exit** Discard Changes and Exit Discard Changes Load Optimal Defaults Load Failsafe Defaults						Exit System Setup after saving the changes. F10 key can be used for this operation. <> Select Screen ↑↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
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Save Changes and Exit

Exit system setup after saving the changes. Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select [Yes] to save changes and exit.

Discard Changes and Exit

Exit system setup without saving any changes. Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than system date, system time, and password, the BIOS asks for a confirmation before exiting.

Discard Changes

Discards changes done so far to any of the setup values. This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select [Yes] to discard any changes and load the previously saved values.

Load Optimal Defaults

Load Optimal Default values for all the setup values. This option allows you to load optimal default values for each of the parameters on the Setup menus, which will provide the best performance settings for your system. The F9 key can be used for this operation.

Load Failsafe Defaults

Load Optimal Default values for all the setup values. This option allows you to load failsafe default values for each of the parameters on the Setup menus, which will provide the most stable performance settings. The F8 key can be used for this operation.

Chapter 5

Driver Installation

If your KEMX-4060 does not come with an operating system pre-installed, you will need to install an operating system and the necessary drivers to operate it. After you have finished assembling your system and connected the appropriate power source, power it up using the power supply and install the desired operating system.
You can download the drivers for the KEMX-4060 from the Quanmax website at www.quanmax.com and install as instructed there. For other operating systems, please contact Quanmax.

NOTE
When the system reboots without connecting the CRT, there might be no image on screen when you insert the CRT/VGA cable. Please pressing <**Ctrl>+<Alt>+<F1>** simultaneously to show the image on screen.

Appendix A

DIO (Digital I/O) Sample Code

```
//=============================================
//KEMX-4060 Series DOS DIO sample program
//Please compile with Turbo C 3.0 to utilized the program
//=============================================

int main()
{
        int RetVal;

        //Clear DIO_OUT 1~4
        RetVal=inp(0x50d);//IO Port: 0x50d
        RetVal=(RetVal&0xCF);//DIO_OUT 1 is bit 4
                             //DIO_OUT 2 is bit 5
        outp(0x50d,RetVal);

        RetVal=inp(0x50e);//IO Port: 0x50e
        RetVal=(RetVal&0xFB);//DIO_OUT 3 is bit 2
        outp(0x50e,RetVal);

        RetVal=inp(0x53a);//IO Port: 0x53a
        RetVal=(RetVal&0xFE);//DIO_OUT 4 is bit 0
        outp(0x53a,RetVal);
        system("pause");

        //Setting DIO_OUT 1~4
        RetVal=inp(0x50d);//IO Port: 0x50d
        RetVal=(RetVal|0x30);//DIO_OUT 1 is bit 4
                             //DIO_OUT 2 is bit 5
        outp(0x50d,RetVal);

        RetVal=inp(0x50e);//IO Port: 0x50e
        RetVal=(RetVal|0x04);//DIO_OUT 3 is bit 2
        outp(0x50e,RetVal);

        RetVal=inp(0x53a);//IO Port: 0x53a
        RetVal=(RetVal|0x01);//DIO_OUT 4 is bit 0
        outp(0x53a,RetVal);
```

```
        system("pause");

        //Reading DIO_IN 1~2
        RetVal=inp(0x50C);//IO Port: 0x50c
                          //DIO_IN 1 is bit 6
                          //DIO_IN 2 is bit 7
        RetVal=((RetVal&0xC0)>>6);
        printf("DI 1/2= %d",RetVal);
        system("pause");

        //Reading DIO_IN 3~4
        RetVal=inp(0x538);//IO Port: 0x538
                          //DIO_IN 3 is bit 6
                          //DIO_IN 4 is bit 7
        RetVal=((RetVal&0xC0)>>6);
        printf("DI 3/4= %d",RetVal);
        system("pause");

        return 0;
}
```

Appendix B

WatchDog Timer Sample Code

```
//=====================================================
// The Watchdog Timer sample code in C format.
// User could user Turbo C 3.0 to compile the code .
//=====================================================

int main()
{
//Initialized the WDT program
  outp(0x2e,0x87);
  outp(0x2e,0x01);
  outp(0x2e,0x55);
  outp(0x2e,0x55);


//Setting Logical Device Number to 0x07
  outp(0x2e,0x07);
  outp(0x2f,0x07);

//Set Timer Value(0x73 is LSB while 0x74 is MSB)
  outp(0x2e,0x73);
  outp(0x2f,0x14);//set to 20 sec (0x14)

//Set Timer Unit to Second/Minute(Bit 7 equal to 1 is second/0 is minute)
//Enable WDT (Bit 6 equal to 1 is enable/0 is disable)
  outp(0x2e,0x72);
  outp(0x2f,0xc0);//The unit is set as second
  return 0;
}
```